



TDMoE Card for Loop-O9500R

Features:

- Hot pluggable interface card for O9500R
- Four Ethernet Ports for WAN or LAN port assignment
 - Two combo Gigabit Ethernet(GbE) with 2 RJ45 and 2 SFP housing
 - Two 10/100/1000 BaseT Ethernet
 - WAN 1+1 Link Aggregation (IEEE 802.1d)
- Max. backplane bandwidth: 8M (Nx64K bps)
- Jumbo Frame reach up to 10K bytes
- Switching & Bridging
 - VLAN
 - Concurrent 255 out of 1~4094 VLAN
 - Q-in-Q
- QoS
 - User configurable CoS
 - User configurable ToS in outgoing IP frame
- Psuedo-wire circuits (bundles)
 - For the entire card: Max.64 PW
 - For E1: Max. 32 PW per E1
 - Average 16 PW per E1
- MAC learning (max. MAC table 8192 entry)
- Packet Delay Variation
 - Max. 256ms for E1
 - Max. 340ms for T1
- L2 switch protocol: RSTP, STP, VLAN
- Jitter & Wander
 - PPM: per G.823 Traffic
- IETF TDMoIP (RFC5087), SAToP (RFC4553), and CESoPSN (RFC5086) compliant
- RoHS Compliant



Description:

Loop Telecom's TDMoE plug-in card is designed for the Loop-O9500R. TDMoE card is used to transport TDM traffic over IP network, in addition to Ethernet traffic. As the communications network migrates from TDM to IP, the TDMoE card provides a flexible and cost effective choice for the transport of legacy TDM signals.

It provides four Ethernet ports with no limitation for WAN or LAN port assignment. The TDMoE card support point-to-point and point-to-multi-point voice and date application.

For transport of TDM signals E1, T1, Jitter and Wander adheres to G.823 Traffic and G.823 Synchronous.

Ordering Information

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model (RoHS compliant)	Description	Note
Loop-O9500-R-TDMoE-PPM- G	TDMoE card with 2 GbE combo interfaces and 2 Ethernet interfaces (10/100/1000BaseT) plug-in module Support G.823 Traffic	

Accessories

User's Manual	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
SFP Optical Modules Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.	

TDMoE for Loop-O9500R Product Specifications

Optical SFP Module Characteristic (please refer to SFP optical module brochure for detail)

Combo Gigabit Ethernet(GbE) Interface

Number of Ports	2
Speed	10/100/1000M bps
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection

Gigabit Ethernet(GbE) Interface

Number of Port	2
Speed	10/100/1000 BaseT
Connector	RJ45

Ethernet Function

Basic Features	MDI/MDIX for 10/100/1000M BaseT auto-sensing Ping function contained ARP Per port, programmable MAC hardware address learn limiting (max. MAC table 8192 (8k) entry) Packet Delay Variation: - Unframed T1: Up to 340 ms - Framed T1: Up to 256 ms - E1: up to 256 ms - Framed T1 with CAS: Up to 192 ms
Packet Transparency	Packet transparency support for all types of packet types including IEEE 802.1q VLAN and 802.1ad (Q-in-Q)
Jumbo Frame	Up to 10K bytes
QoS	User configurable 802.1p CoS, ToS in out going IP frame
Traffic Control	Ingress packet Rate limiting buckets per port for ethernet port Supporting Rate-based and Priority-based rate limiting for LAN port Granularity: a. From 64 Kbps to 1 Mbps in increments of 64 Kbps b. From 1 Mbps to 100 Mbps in increments of 1 Mbps c. From 100 Mbps to 1000 Mbps in increments of 10Mbps
	Pause frame issued when the traffic exceeding the limited rate before packet dropped following IEEE802.3X
Link Aggregation	WAN supports 1+1 Link Aggregation

Jitter & Wander

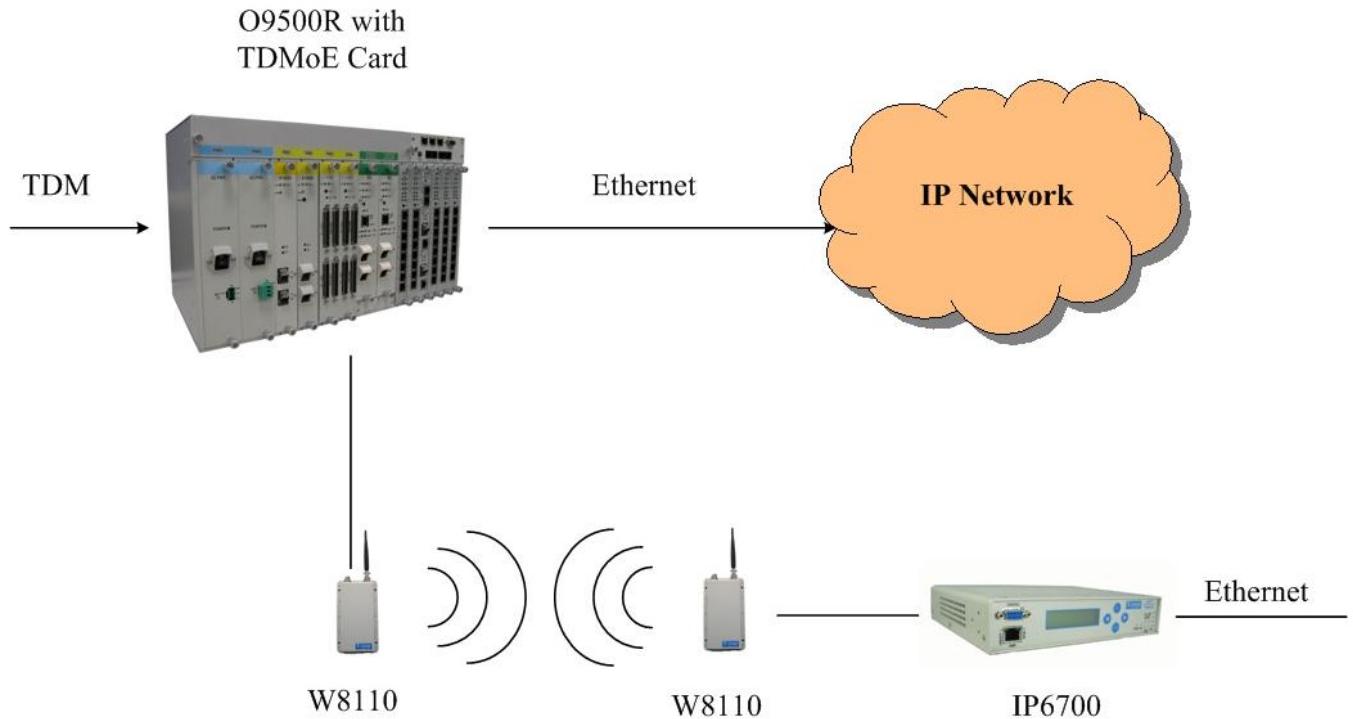
PPM: per G.823 Traffic

Standard Compliance

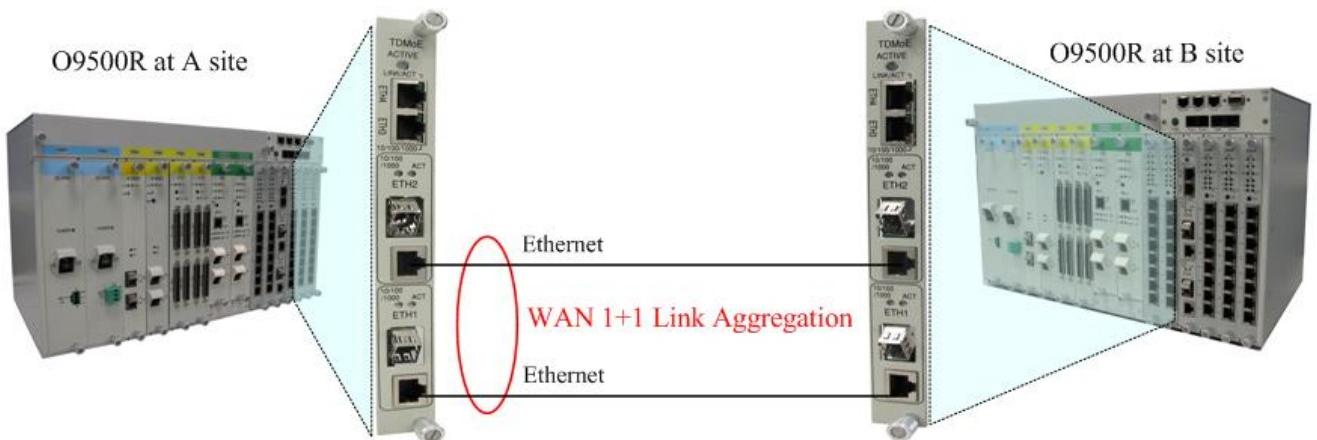
IETF	TDMoIP (RFC5087), SAToP (RFC4553), CESoPSN (RFC5086)
IEEE	802.1q, 802.1p, 802.1d, 802.3, 802.3u, 802.3x, 802.3z, 802.1s, 802.1w, 802.1AX

Application Illustrations

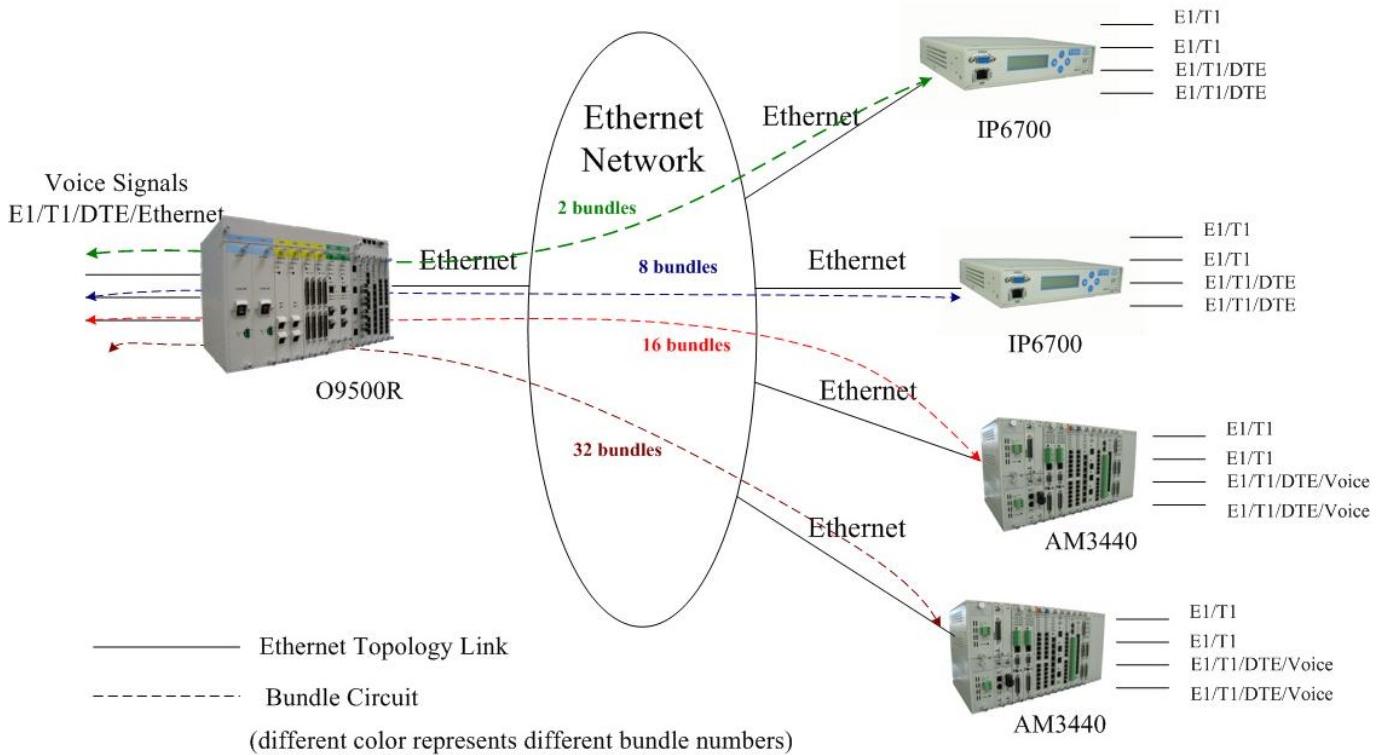
TDMoE plug-in card in O9500R is to transport TDM traffic (voice signals/E1/ T1/ DTEs/ Ethernet) into IP Traffic.



Point to Point Application (with WAN 1+1 Aggregation)



Point to Multipoint Application



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Version 4 25 OCT 2011

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12FXS/12FXO Voice Card for Loop-O9500R

Features

- 12 telephone connections for FXS
- 12 central office or PBX line connections for FXO
- PLAR supported
- Loop start or Loop start/ground start option
- Battery reverse supported
- DID supported
- 12KHz and 16KHz metering pulse option.
- A, B, C, D signaling bit software programmable
- A law or μ -law coding
- Most signaling conventions supported
- Multi-color LED indicators for each port
- Intended for use with -48Vdc powered main units



12 Channel FXO Card



12 Channel FXS Card

Description

The 12FXS/12FXO plug-in cards are designed for the single slot of Loop-O9500R. It allows voice frequency interfaces to be multiplexed as a 64 Kbps DS0 signal onto a digital network. 12 FXS provides 12 voice Interfaces connect to telephones. 12FXO provides connections from telephone lines, either from a central office or from a PBX in RJ11X12 connector.

Coding is either A-law or μ -law selectable by user. Most popular signaling conventions are supported, including PLAR.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
Loop-O9500-R-12FXS-sn-pt- G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, without Ground Start and Metering Pulse. Used with 12 RJ11.	"12FXS-x" cards with H/W ver. L and F/W V.3.01.01 or newer versions. It can also be used in the Loop-AM3440-A/B/C
Loop-O9500-R-12FXS-P-sn-pt- G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, without Ground Start and Metering Pulse PLAR bit programmable function. Used with 12 RJ11.	12FXS-GMP includes all FXS card functions
Loop-O9500-R-12FXS-M-pt- G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Metering Pulse]. Used with 12 RJ11.	For sn option, please refer to the table below for detail information. pt = power type
Loop-O9500-R-12FXS-MPP-pt- G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR and PLAR bit programmable function, [Metering Pulse]. Used with 12 RJ11.	For pt option, please refer to the table below fro detail information
Loop-O9500-R-12FXS-GS-pt- G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Ground Start]. Used with 12 RJ11.	

Loop-O9500-R-12FXS-GM- pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Ground Start, and Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXS-GMP- pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR and PLAR bit programmable function, [Ground Start, and Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXO- G	12-channel FXO plug-in card with 600/900 Impedance, Battery Reverse and Loop Start. Without Ground Start and Metering Pulse. Used with 12 RJ11.	12FXO-GM includes all FXO card functions
Loop-O9500-R-12FXO-M- G	12-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and [Metering Pulse]. Used with 12 RJ11.	12FXO-GM includes all FXO Card functions.
Loop-O9500-R-12FXO-GS- G	12-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and [Ground Start]. Used with 12 RJ11.	"12FXO-x" cards with H/W ver. G and F/W V2.01.01 or newer versions. It can also be used in the AM3440-A /B/C
Loop-O9500-R-12FXO-GM- G	12-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, [Ground Start] and [Metering Pulse]. Used with 12 RJ11.	

Accessories

User's Manual

Loop-O9500-R-FXSFXO-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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For 12-channel FXS Card:

- Where **sn** is used to select special function. If this option is not required, omit the **sn** field in the ordering code.

sn =	Description	Note
S1	FXS Loop Feed = -48 Vdc with 35 mA current limit	
S4	Remove alarm tone	
S5	Double ring tone transmit	

Note: For **sn** (special function), please contact your nearest Loop sales representative.

- Where **pt** is used to select the following functions.

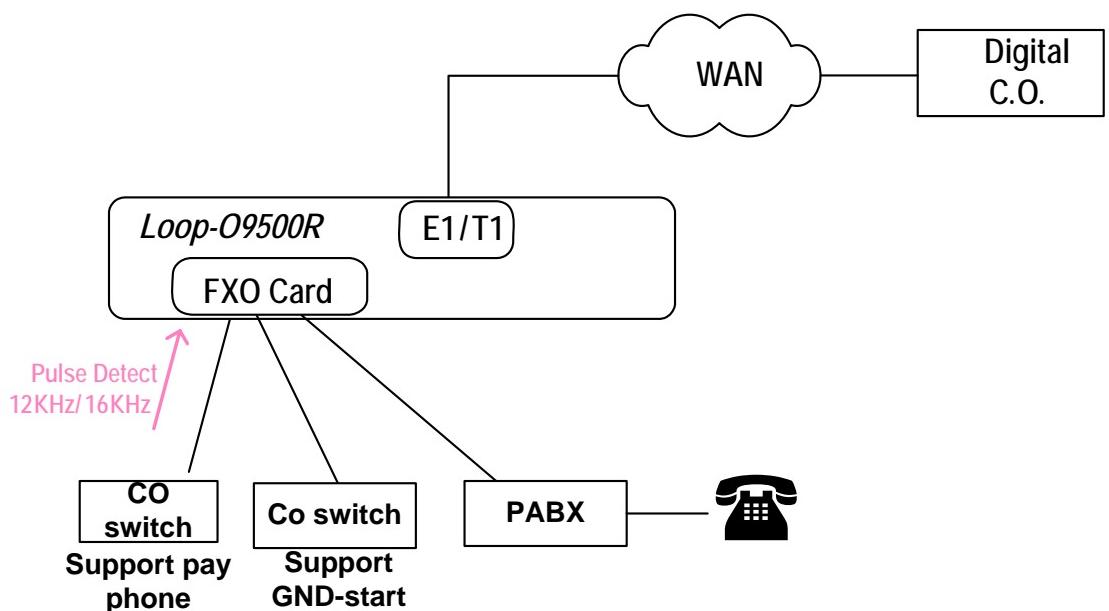
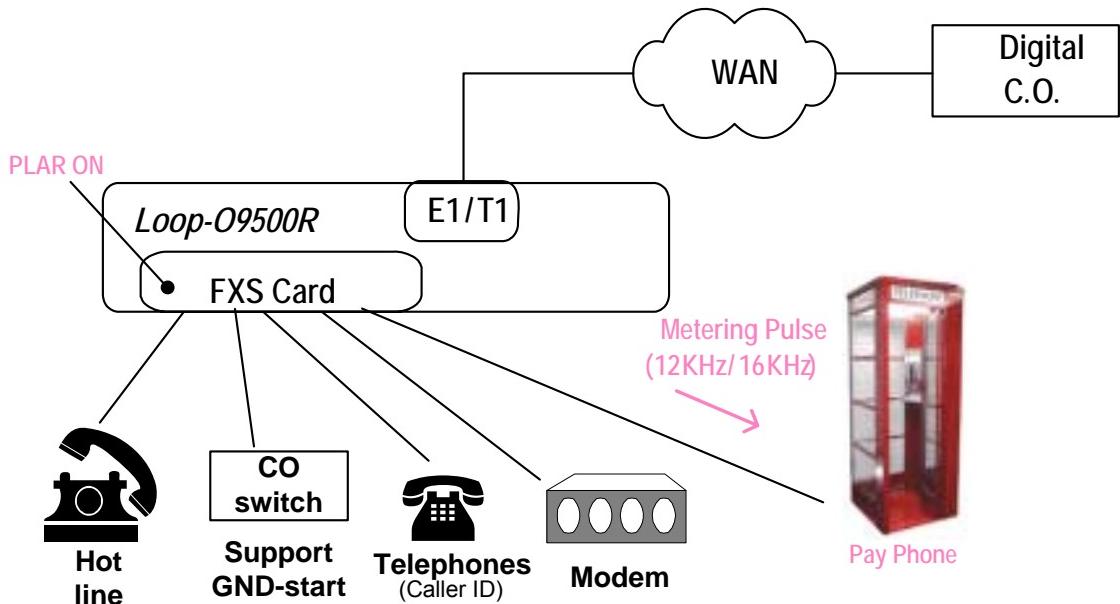
pt=	Description	Note
PWR	complied with -48 Vdc (SD48) power modules	
PWRIE1613	complied with IEEE1613 standard, and with -48 Vdc (SD48) power modules	

12FXS/FXO Product Specifications

Voice Card (12FXS, 12FXO)

Connector	Twelve RJ11										
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF										
Encoding	A-law or μ -law, user selectable together for all										
AC Impedance	Balanced 600 or 900 ohms (selectable together for all)										
Longitudinal Conversion Loss	> 46dB										
Cross talk measure	Max -70dBm0										
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive										
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input										
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712										
Idle Channel Noise	Max. -65 dBm0p										
Variation of Gain	± 0.5 dB										
FXO	<table><tr><td>Ringing REN</td><td>0.5B (AC)</td></tr><tr><td>Detectable Ringing</td><td>25 Vrms</td></tr><tr><td>Loop Resistance</td><td>$\leq 1800 \Omega$</td></tr><tr><td>DC Impedance (ON-HOOK)</td><td>> 1M Ω</td></tr><tr><td>DC Impedance (OFF-HOOK)</td><td>235 Ω @ 25 mA feed 90 Ω @ 100 mA feed</td></tr></table>	Ringing REN	0.5B (AC)	Detectable Ringing	25 Vrms	Loop Resistance	$\leq 1800 \Omega$	DC Impedance (ON-HOOK)	> 1M Ω	DC Impedance (OFF-HOOK)	235 Ω @ 25 mA feed 90 Ω @ 100 mA feed
Ringing REN	0.5B (AC)										
Detectable Ringing	25 Vrms										
Loop Resistance	$\leq 1800 \Omega$										
DC Impedance (ON-HOOK)	> 1M Ω										
DC Impedance (OFF-HOOK)	235 Ω @ 25 mA feed 90 Ω @ 100 mA feed										
FXS Loop Feed	-48Vdc with 25mA current limit per port Jumper Selectable: 25mA, 30mA, 35mA										
FXS signalling	Normal / Automatic Ring down										
FXS Ringing	1 REN at 5K meters per port 16.7Hz, 20Hz, 25Hz, 50Hz, user selectable for all ports 38 to 85 Vrms (sine wave), 76 Vrms for default Ring Voltage 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR Loop Start, DTMF, pulse, PLAR, Battery Reverse										
Signaling	Ground Start, Metering pulse (12 KHz, 16 KHz), and P(in PLAR mode, PLAR signalling bits are programmable.										
Optional Signaling (for special order)											
Signaling Bit A,B,C,D	Programmable bit										
<ul style="list-style-type: none">All in-band signaling tones are carried transparently by the digitizing process.Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.											

Application Illustrations



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24 FXS/FXO Voice Card for Loop-O9500R

Features:

- 24 telephone connections for FXS
- 24 central office or PBX line connections for FXO
- PLAR supported
- Loop start or Loop start/ground start option
- Battery reverse supported
- DID supported
- 12KHz and 16KHz metering pulse option
- A, B, C, D signaling bit software programmable
- A-law or μ -law coding
- Most signaling conventions supported
- Multi-color LED indicators for each card
- Intended for use with -48Vdc powered main units
- RJ 21X (Telco 50 pin) Connector
- Occupies two full size slot (slots 11~16) of O9500R device.



Description

The 24FXS/24FXO plug-in cards are designed for the dual slot of Loop-O9500R device. It allows voice frequency interfaces to be multiplexed as a 64 Kbps DS0 signal onto a digital network. The 24FXS provides 24 voice interfaces connect to telephones. The 24FXO provide connections from telephone lines, either from a central office or from a PBX in a single RJ21X (Telco 50pin) connector.

Coding is either A-law or μ -law selectable by user. Most popular signaling conventions are supported, including PLAR.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model (RoHS compliant)	Description	Note
Loop-O9500-R-24FXS-sn-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and PLAR Without Ground Start and Metering Pulse	24FXS-GMP includes all FXS card functions.
Loop-O9500-R-24FXS-P-sn-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [PLAR bit programmable]. Without Ground Start and Metering Pulse	These cards will occupy two slots. These cards can also be used in the Loop-AM3440-A /B/C
Loop-O9500-R-24FXS-M-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [Metering Pulse].	
Loop-O9500-R-24FXS-MPP-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [PLAR bit programmable] and [Metering Pulse].	For sn option, please refer to the table below for detail information
Loop-O9500-R-24FXS-GS-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [Ground Start].	pt =power type
Loop-O9500-R-24FXS-GM-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [Ground Start] and [Metering Pulse].	For pt option, please refer to the table below fro detail information
Loop-O9500-R-24FXS-GMP-pt- G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [PLAR bit programmable], [Ground Start] and [Metering Pulse].	
Loop-O9500-R-24FXO-pt- G	24-channel FXO plug-in module with 600/ 900 Impedance, Battery Reverse, without Ground Start and Metering Pulse	
Loop-O9500-R-24FXO-M-pt- G	24-channel FXO plug-in module with 600/ 900 Impedance, Battery Reverse, [Metering Pulse]	
Loop-O9500-R-24FXO-GS-pt- G	24-channel FXO plug-in module with 600/ 900 Impedance, Battery Reverse, [Ground Start]	24FXO-GM includes all FXO card functions
Loop-O9500-R-24FXO-GM-pt- G	24-channel FXO plug-in module with 600/ 900 Impedance, Battery Reverse, [Ground Start, and Metering Pulse]	

Accessories

User's Manual

Loop-O9500-R-FXSFXO-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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For 24-channel FXS card:

- Where **sn** is used to select special function. If this option is not required, omit the **sn** field in the ordering code.

sn =	Description	Note
S1	FXS Loop Feed = -48 Vdc with 35 mA current limit	
S4	Remove alarm tone	
S5	Double ring tone transmit	

Note: For **sn** (special function), please contact your nearest Loop sales representative.

- Where **pt** is used to select the following functions.

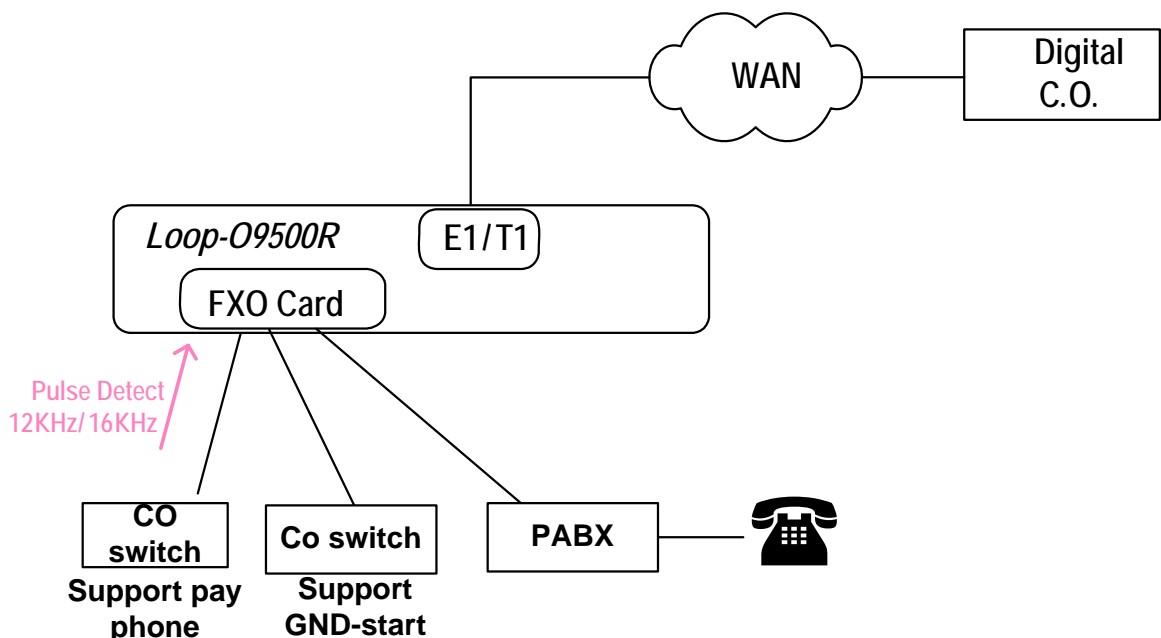
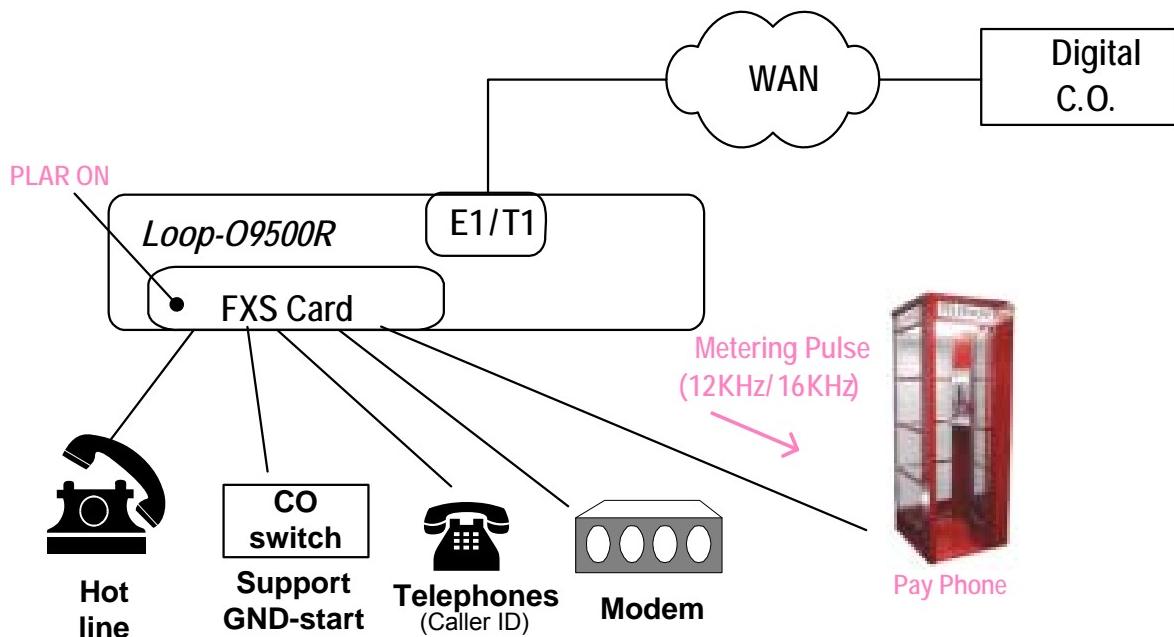
pt=	Description	Note
PWR	complied with -48 Vdc (SD48) power modules	
PWRIE1613	complied with IEEE1613 standard, and with -48 Vdc (SD48) power modules	

24 FXS/FXO Product Specifications

Voice Card (24FXS, 24FXO)

Connector	One RJ21X										
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF										
Encoding	A-law or μ -law, user selectable together for all										
AC Impedance	Balanced 600 or 900 ohms (selectable together for all)										
Longitudinal Conversion Loss	> 46dB										
Cross talk measure	Max -70dBm0										
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive										
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input										
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712										
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Variation of Gain	± 0.5 dB										
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FXS Loop Feed	-48Vdc with 25mA current limit per port Jumper Selectable: 25mA, 30mA, 35mA										
FXS signalling	Normal / Automatic Ring down										
FXS Ringing	1 REN at 5K meters per port 16.7Hz, 20Hz, 25Hz, 50Hz, user selectable for all ports 38 to 85 Vrms (sine wave), 76 Vrms for default Ring Voltage 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR Loop Start, DTMF, pulse, PLAR, Battery Reverse Ground Start, Metering pulse (12 KHz, 16 KHz), and P(in PLAR mode, PLAR signalling bits are programmable.										
Signaling	Programable bit										
Optional Signaling (for special order)	<ul style="list-style-type: none">All in-band signaling tones are carried transparently by the digitizing process.Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.										

Application Illustrations



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4E1/T1 Interface Card for Loop-O9500R

Features

- Contains four E1/T1 Interface.
- Usable as a CSU/DSU, T1 to E1 converter.
- Full TSI capability among all time slots in the main unit
- Remote diagnostics
- Single LED indicator per port
- Software field upgradable



Description

Loop Telecom's QT1/QE1 plug-in cards are a series of 2 different plug-in cards designed for the Loop-O9500R. They allow each DS0 time slot in QT1 or QE1 interfaces to be interchanged and multiplexed onto a digital network.

Continuous error checking, performance polling, and in-service diagnostics are provided through the main controller of the Loop-O9500R. In addition, an LED on the plug-in provides status indication.

Ordering Information

To specify options, choose from list below:

Model (RoHS compliant)	Description	Note
Main Unit		
Loop-O9500-R-4E1-cc-G	4-channel E1 plug-in card. For cc option, please refer to the table below for detail information	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-4T1-G	4-channel T1 plug-in card	This card can also be used in the Loop-AM3440-A /B/C.
Accessories		
User's Manual (All User's Manuals are RoHS compliant)		
Loop-O9500-R-4E1T1-UM	Optional hard-copy (paper) User's Manual. A CD version of the manual is already included as a standard package.	

■ Where **cc** is used to select connector:

cc =	Description	Note
RJ	RJ48C connector	
BNC	BNC connector	

Product Specifications for 4E1/T1 Interface Card

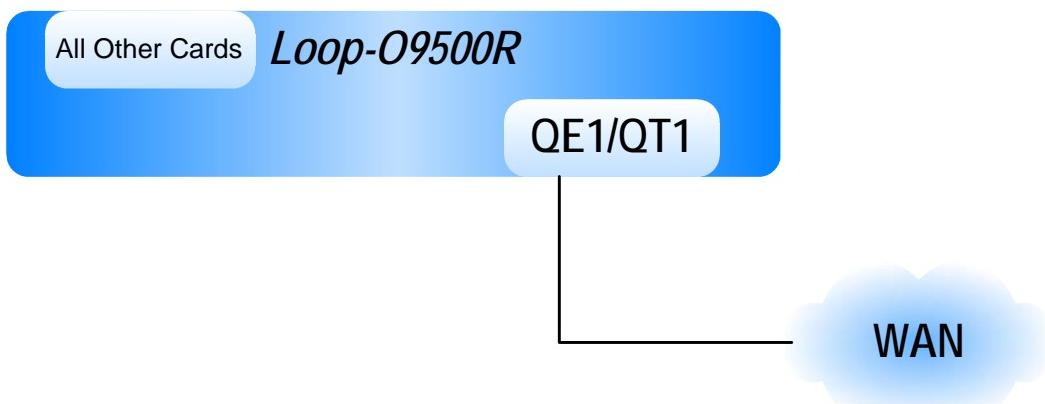
Network Line Interface – 4E1

Line Rate	2.048 Mbps ± 50 ppm	Framing	ITU G.704
Line Code	AMI or HDB3	Connector	BNC/RJ48C
Input Signal	ITU G.703	Electrical	75 ohm Coax/120 ohm twisted pair
Output Signal	ITU G.703	Jitter	ITU G.823

Network Line Interface - 4T1

Line Rate	1.544 Mbps ± 32 ppm	Output Signal	DSX1w/0, -7.5, -15 dB LBO
Line Code	AMI or B8ZS	Framing	D4/ESF (selectable)
Input Signal	DSX-1 0 dB to -30 dB w/ALBO	Connector	RJ48C

Application Illustration



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ISO 9001/ISO 14001

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7 Fiber Optical Interface for Loop-O9500R

Features

- Hot-pluggable high-speed interface card for O9500R IMAP
- Aggregate ports
- 7 aggregate ports with SFP housing, each supports 4 E1s.
- Port Protection
 - Line 1+1 (requires two cards)
 - Switching time within 50ms
- Automatic Laser Shutdown (ALS) function
- Single mode and multi-mode fiber modules
- Local and remote FOM alarm indication



Description

The Loop-O9500R 7 FOM card is a high-speed module that can connect with the AM3440 series and Loop-O9310-E1 using Loop proprietary FOM interface. Each card has 7 FOM interfaces. Each FOM interface supports up to 4 E1 aggregate channels. The 7 FOM card is E1 mode configurable and supports Tributary Line 1+1 Protection. When protection enable with 1+1, the O9500R can support up to 14 ports of FOM.

Ordering Information

Note: RoHS compliant unit is identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
Loop-O9500-R-7FOM- G	7 Ports Fiber Optical Interface with 7 SFP housings (SFP not included)	This card can also be used in the Loop-O9400-R

Accessories

SFP Optical Modules

Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.

User's Manual

Loop-O9500-R-7FOM-UM User's Manual (paper, hard copy-optional). A CD version of the manual is already included as standard package.

Product Specifications

Fiber Optical Interface

Port number	7	Line Code	Scrambled NRZ
Source	Laser		
Wavelength	1310 ± 50 nm, 1550 ± 40 nm		
Optical Line Rate	38.84Mbps		
Connector	SFP housing with LC type		

Reach 2~240 Km (please refer to the SFP brochure for detail) Protection 1+1 Line Protection

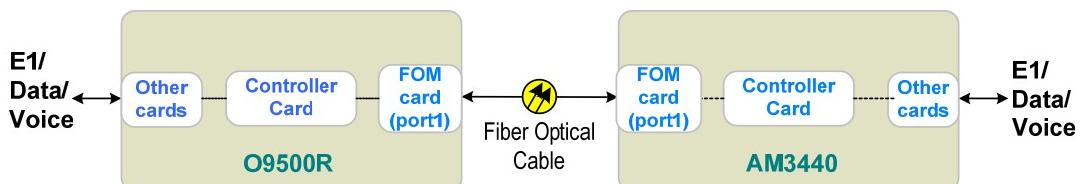
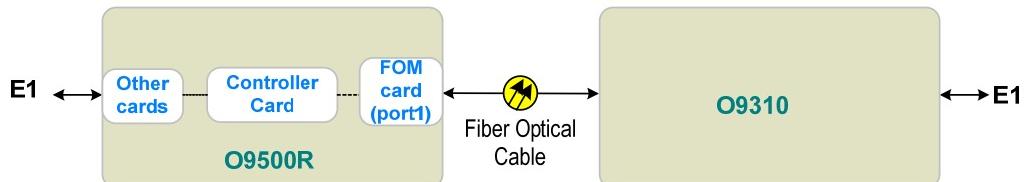
Optical Fiber Interface Characteristics (Please refer to SFP optical brochure for detail)

Diagnostics Test

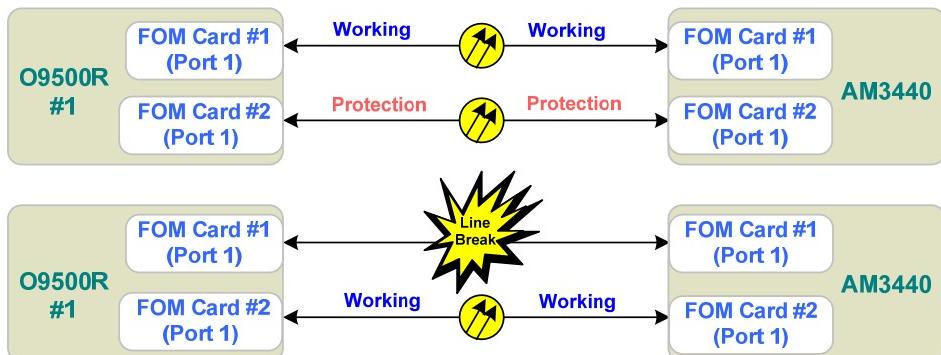
Optical Fiber Local and remote loopbacks
E1 Test Pattern To optical direction or backplane direction

Application Illustrations

Point to Point



1 + 1 Line Protection



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8RS232 Interface Card for Loop-O9500R

Features

- Support X.50 division 2 and X.54
- Single slot
- Two card types:
 - 8 RJ48 only card: 8 ports RS232 Async
 - 2 RJ48 + 2 DB44 card: Up to 4 ports RS232 Sync + 4 ports RS232 Async
- LED status indicator
- Hot swappable
- Support Async rates from 600bps to 38400 bps
- Support Sync rates from 600bps to 64000 bps



Description

The 8RS232 Interface Card for Loop-O9500R has 8 interface ports. For the RJ version, 8 RJ48 connectors are available in Asynchronous mode only. For the DB version, 2 RJ48 provide 2 ports and 2 DB44 connectors provide 3 ports each. Two cables are included. Each cable converts from DB44 connector to two DB25 and one DB9 connectors.

For Asynchronous signals, the card can be used in either INDEPENDENT mode or MUX mode. In the INDEPENDENT mode, each of the 8 Asynchronous ports up to 38.4 Kb/s rate, is assigned a separate 64 Kb/s channel. In the MUX mode, up to 5 ports, each up to 9.6 Kb/s, can share a single 64 Kb/s channel. The rest 3 ports will be multiplexed to another 64Kb/s channel.

For Synchronous signals, only four of the ports can be used, leaving another 4 ports as Asynchronous. In the INDEPENDENT mode, each of the 4 Synchronous ports can be up to 64 Kb/s. The rest of the 4 Asynchronous ports, each up to 38.4 Kb/s rate, is assigned a separate 64 Kb/s channel per port. In the MUX mode, the 4 Synchronous ports, each up to 9.6 Kb/s, share a single 64 Kb/s channel. The other 3 Asynchronous ports will be multiplexed to another 64Kb/s channel.

The 8RS232 Interface Card uses the multiplexing format defined in ITU-T X.50 Div.2 and in X.54 for rates below 64kbps. For 64kbps transport, standard RS232 format is used. In the INDEPENDENT mode when only one substrate signal is transported, the unused bandwidth is filled with "1s".

Ordering Information

To specify options, choose from list below.

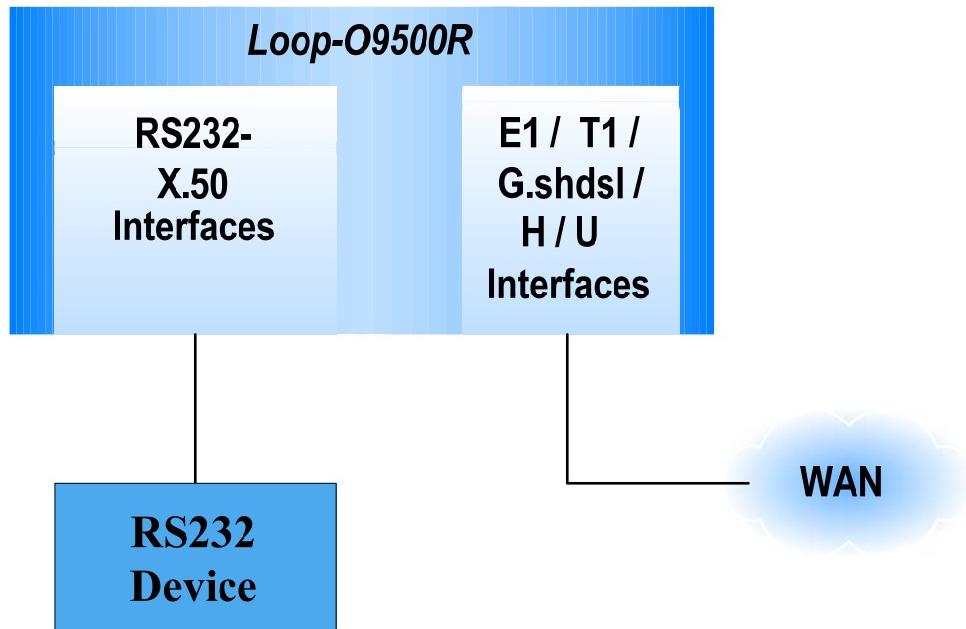
Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of ordering code.

Model	Description	Note
Main Unit		
Loop-O9500-R-8RS232-RJ-G	8-port RS232 plug-in card with X.50 substrate multiplexing scheme and X.54 encoding, with 8 RJ48 connectors for 8 RS232 Async ports	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8RS232-DB-G	8-port RS232 plug-in card with X.50 substrate multiplexing scheme and X.54 encoding, with 2 RJ48 connectors and 2 DB44 connectors for Async and Sync ports	Two conversion cables are included. (Each cable has one DB44 connector to one DB9 and two DB25 connectors). This card can also be used in the Loop-AM3440-A /B/C.
Conversion Cables(All conversion cables are RoHS compliant)		
Loop-ACC-CAB-DB44M-100-2DB25F-1DB09F-DB	DSUB-44 pin/Male to two DSUB-25 pin/Female- one DSUB-9 pin/Female Length 100cm	Used in Loop-O9500-R-8RS232-DB-G plug-in card
Accessories		
User's Manual (All User's Manuals are RoHS compliant)		
Loop-O9500-R-8RS232-UM	Optional hard-copy (paper) User's Manual. A CD version of the manual is already included as a standard package.	

Product Specifications for DTE Interface Cards

DTE(RS232-X.50 mux. 8-port) Interface (RS232/V.24)

Application Illustration



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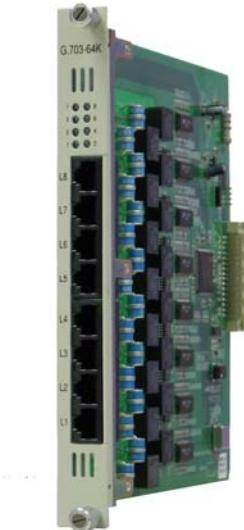
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G.703 Interface Card for Loop-O9500R

Features

- 8-port G.703 plug-in card, single slot to O9500R chassis
- Support data rate at 64 Kbps
- Support G.703 transmission over balanced wire
- Eight LED indications per card



Description

The G.703 plug-in card is designed for the single slot of Loop-O9500R. This interface supports 64 Kbps data transport using the G.703 co-directional timing standard.

The G.703 plug-in card supports diagnostics and alarm setup using a local or remote terminal connected to the main unit. This allows in-service diagnostics and fault isolation.

Ordering Information

To specify options, choose from the list below:

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of ordering code.

Model	Description	Note
Loop-O9500-R-8CD- G	8-channel G.703 plug-in card at 64 Kbps data rate	This card can also be used in the Loop-AM3440-A /B/C.

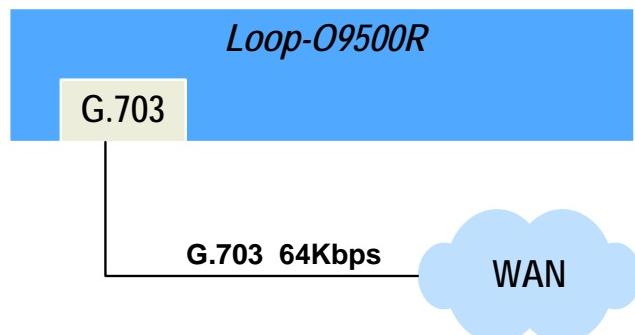
Accessories

User's Manual	
Loop-O9500-R-8CD-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.

Product Specifications for G.703 Interface Card

Interface	ITU G.703 64 Kbps co-directional interface
Connector	120ohm, RJ48
Line Distance	Up to 500 meters
Loopback	DTE Payload Loopback, Local Loopback

Application Illustration



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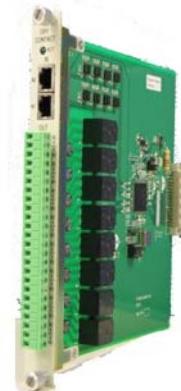


Dry Contact Interface Card for Loop-O9500R

Features

- Two Dry Contact plug-in card are available
 - Dry Contact Card
 - Dry Contact type B card
- Dry Contact Inputs
 - 8 pairs per card (2 ports per card, 4 pairs per port)
 - Connector: RJ45
 - Collect dry contact input signals and send alarm traps via SNMP port or inband to LoopView EMS management system
 - Collect dry contact to be transferred via the E1 or fiber optic cable to a dry relay contact output
- Dry Contact Outputs
 - 8 pairs per card
 - Connector: Screw
 - Enable dry contact output signals through instructions via SNMP port or inband to LoopView EMS management system
 - Enable dry contact from the E1 or fiber cable to a dry relay contact output
 - Support Normal Closed/Open

Dry Contact



Dry Contact-B



Description

Loop Telecom's Dry Contact card and Dry Contact type B plug-in card are designed for the Loop-O9500R. These Dry Contact cards, which can be assigned to 2 DS0 time slots or 16 DS0 time slots, are used for (1) collecting alarm inputs from non-SNMP devices and issuing alarm via SNMP trap, (2) sending commands to close remote contacts for relay devices, and (3) repeat a remote contact closure with a local contact closure. The difference between Dry Contact and Dry Contact type B interface cards is the higher voltage for type B interface card. These cards are used to detect remote contact closures activated by alarms and to provide remote contact closures to control network operation where needed.

When 2 DS0 time slots are chosen to carry the dry contact signals, 8 bits of one time slot carry the input contact status, and 8 bits of the other carry the output contact commands. When 16 DS0 time slots are chosen to carry the dry contact signals, one bit of each of 8 DS0 time slot carry the input contact status, and one bit of each of other 8 DS0 carry the output commands.

Ordering Information

To specify options, choose from list below:

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
Main Unit		
Loop-O9500-R-8DC- G	8-channel dry contact I/O plug-in card	These cards can also be used in the Loop-AM3440-A /B/C.
Loop- O9500-R-8DCB- G	8-channel dry contact type B plug-in card with maximum voltage 220 Vdc or 250 Vac	
Accessories		
User's Manual (All User's Manuals are RoHS compliant)		
Loop-O9500-R-8DC-UM	Optional hard-copy (paper) User's Manual. A CD version of the manual is already included as a standard package.	

Product Specifications for Dry Contact Card

Dry Contact I/O card (8DC)

Inputs -

8-channel Connector	2-port per card, 4-pair per port RJ45
Internal Resistance	1 K
Activation Current	3 ma
Deactivation Current	1.5 ma
Allowable Current	4 ma

Outputs -

8-channel Connector	8-pair per card Screw type
Initial Insulation Resistance	Min. 100M ohm (at 500 Vdc)
Max. Current	5A

Max. Voltage 100 Vdc, 250 Vac

Dry Contact Type B Interface

Inputs -

8-channel Connector	2-port per card, 4-pair per port RJ45
Internal Resistance	100 K
Activation Current	3 ma
Deactivation Current	1.5 ma
Allowable Current	4 ma

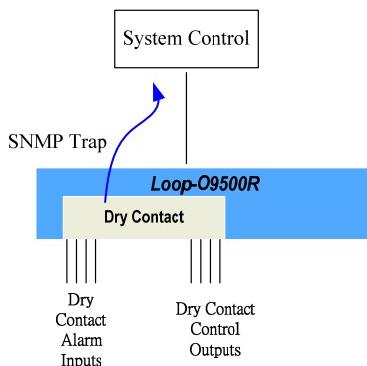
Outputs -

8-channel Connector	8-pair per card Screw type
Initial Insulation Resistance	Min. 1000M ohm (at 500 Vdc)
Max. Current	2A

Max. Voltage 220 Vdc, 250 Vac

Application Illustrations

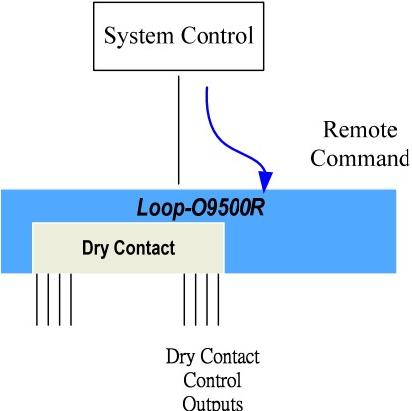
Dry Contact Input Application - SNMP Trap



When the alarm occurs, this is detected by the dry contact input. The dry contact card will send alarm trap to Control Center via **SNMP port** for management.

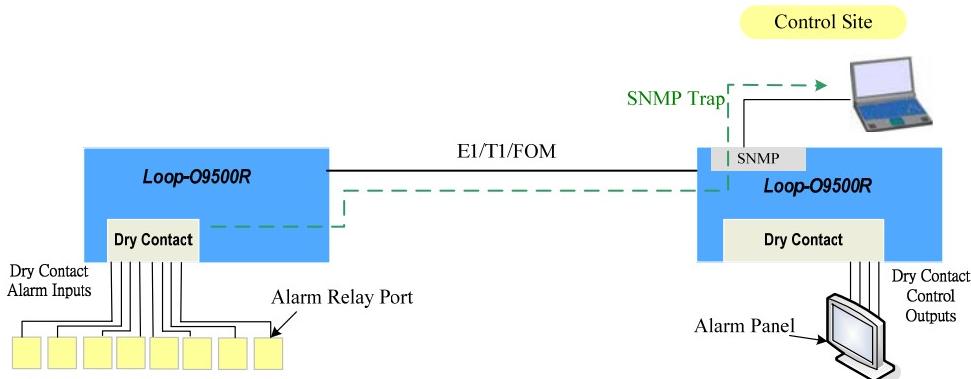
Dry Contact Output Application - Remote Contact Control

From the Control Center, any dry contact can be made to close by remote commands



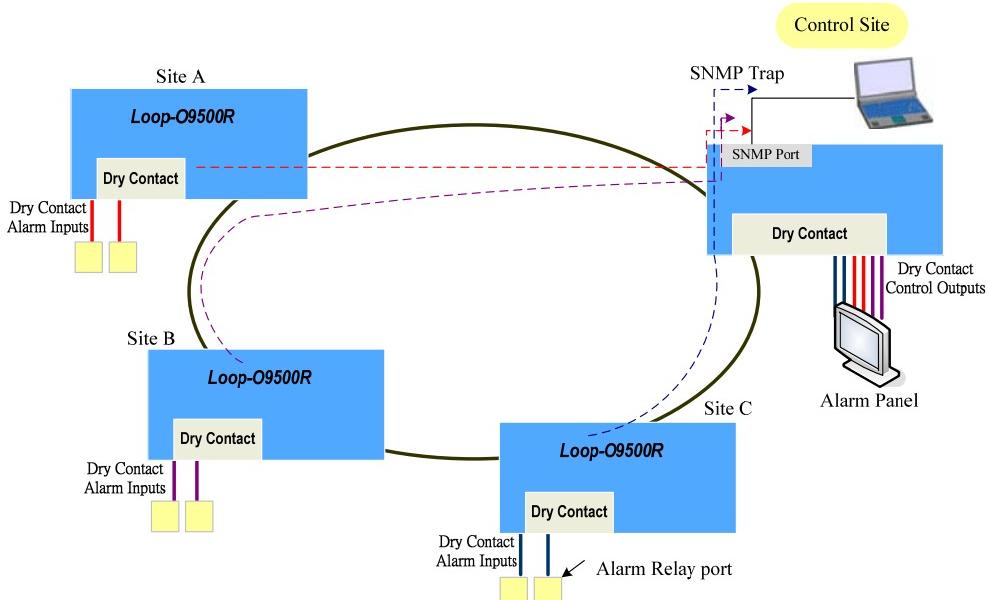
Point to Point Application — Using both input and output dry contacts

Using one DS0 for alarm input and one DS0 for alarm output, and vice versa. When the alarm occurs, it will send alarm trap via SNMP port for management. Also, the dry contact inputs at local site can be detected and transmitted to the dry contact outputs at the control site.



Point to Multi-Point Application

Using the 16 DS0 to carry the alarm input and alarm output (8 DS0 for input, 8 DS0 for output), and vice versa. When the any of the assigned of the alarm occurs, it will send alarm trap via SNMP port for management. From the central management point, all dry contact outputs can be controlled.



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V.35/ X.21/V.36/RS449/EIA530/ RS232 Interface Card for Loop-O9500R

Features

- Maximum data rate of n x 64K ($n \leq 32$)
- Mapping to any sequential time slots
- Supports ANSI V.54
- Built-in BERT for diagnostics



Description

The V.35/V.36/EIA530/RS232/X.21 plug-in cards are a series of 4 different plug-in cards designed for the dual slot of Loop-O9500R. They allow multiplexing of n x 64 Kbps data to multiples of DS0 time slots onto a digital network.

An LED on the front panel of the Loop-O9500R provides status indication.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model (RoHS compliant)	Description	Note
Loop-O9500-R-6X21A-G	6-channel X.21/V.11 card with DB15 connector	
Loop-O9500-R-6V35A-G	6-channel V.35 plug-in card with DB25S connector, for M34. (2Mbits per channel) Please order conversion cable connector below.	These cards will occupy two slots. These cards can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-6V36A-G	6-channel V.36 card with DB25 connector via conversion cable to DB37	
Loop-O9500-R-6E530A-G	6-channel EIA530 plug-in card with DB25 connector	
Loop-O9500-R-6RS449A-G	6-channel EIA530/RS449 plug-in card with DB25 connector via conversion cable to DB37	

Accessories

Conversion Cables (All conversion cables are RoHS compliant)

Loop-ACC-CAB-DB25M-30-1M34F	DSUB-25pin/Male to M34/Female V.35 Conversion cable Length: 30 cm	Used in Loop-O9500-R-6V35A-G plug-in card
Loop-ACC-CAB-DB25M-30-1DB37F	DSUB-25pin/Male to DSUB-37/Female RS449 Conversion cable Length: 30 cm	Used in Loop-O9500-R-6V36A-G and Loop-O9500-R-6R449A-G plug-in cards

User's Manual

Loop-O9500-R-DTE-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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Product Specifications for DTE Interface Cards

DTE(X.21/V.11) Interface (-6X21A)

Data Port Up to six 6-port DTE X.21 card; 1-port DTE X.21 card (future option)
Data Rate 56 or 64 Kbps, n = 1 to 32
Connector DB15

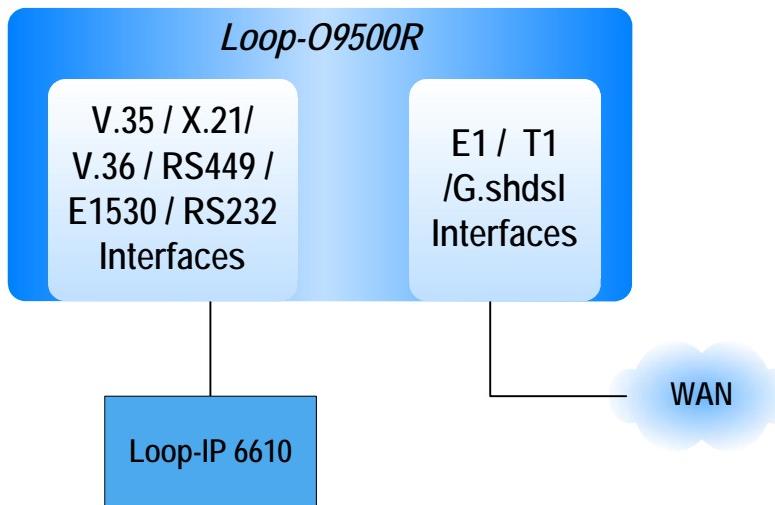
DTE (V.35/ V.36) Interface (6V35A/6V36A)

Data Port Up to six 6-port DTE V.35/ V.36 cards
Data Rate 56 or 64 Kbps, n = 1 to 32
Connector For V.35 card: DB25S (optional conversion cable DB25S to M34 connector)
For V.36 card::DB25S (optional conversion cable DB25S to DB37 connector)

DTE (EIA530/RS449) Interface (6 EIA530A/6RS449A)

Data Port Up to six 6-port EIA530 DTE card
Data Rate 56 or 64 Kbps, n = 1 to 32
Connector DB25S (optional conversion cable DB25S male to DB37 female connector for RS449)

Application Illustration



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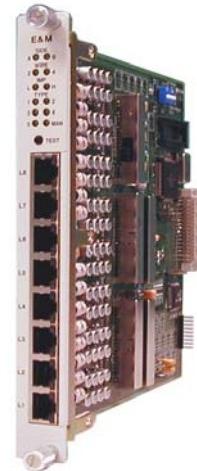
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E&M Voice Card for Loop-O9500R

Features

- RJ45 x 8 connector for E&M
- E&M signaling types are supported: Type 1, Type 2, Type 3, Type 4 and Type 5.
- Programmable gain setting per-port
- A side and B side supported
(A side is exchange side, B side is carrier side)
- 2 wire, 4 wire supported
- Transmit only (TO) type supported
- law or μ -law coding
- Intended for use with -48Vdc powered main units.



Description

Loop Telecom's E&M plug-in card is designed for the Loop-O9500R device. It allows 8 ports E&M interfaces to be multiplexed to 64 Kbps DS0 signals. It can also be used as TO (Transmit Only)

Voice coding can be selected as either A-law or μ -law.

This unit can be used on systems running -48Vdc power supply.

Ordering Information

To specify options, choose from list below:

Model (RoHS compliant)	Description	Note
Loop-O9500-R-8EM-x-G	8-channel 2W/4W E&M plug-in card	"8EM" card with H/W ver. F (and later versions), F/W V4.01.01 (and later versions) can also be used in the Loop-AM3440-A /B/C. For x option, please refer to the table below.

Accessories

User's Manual

Loop-O9500-R-8EM-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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■ Where x is used to select signaling bits type and special functions:

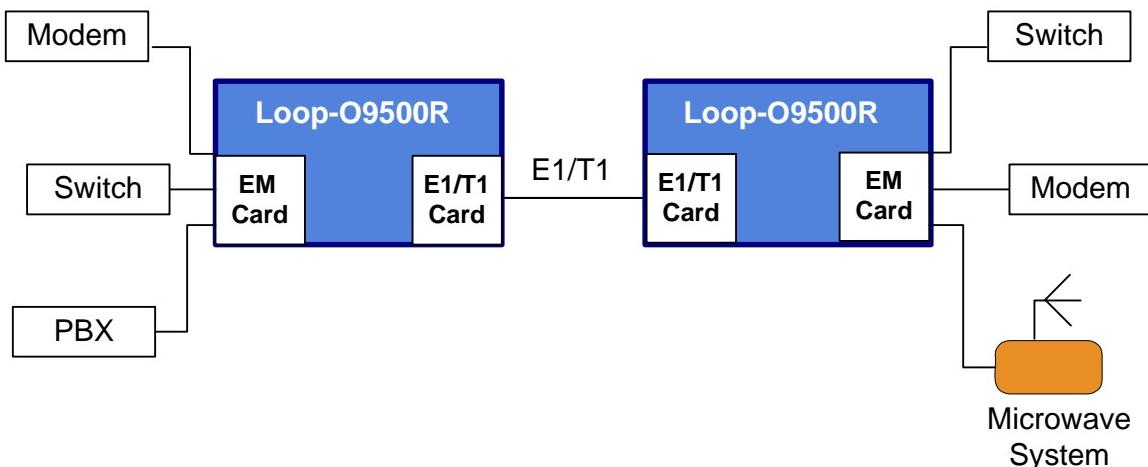
8EM	x =	Description	Note
	E	Follows ETSI signaling bits	
	A	Follows ANSI signaling bits	
	R	Reverse for ON-HOOK and OFF-HOOK signaling bits exchange	
	S	Follows customer's special bit or function assignment	
	AR	Follows ANSI signaling bits and reverse bit	
	S4	Disable the function of the test button	
	S5	Forcing all ports to be OFF-HOOK when an alarm occurs	Jumper selectable for all channels
	S6	Forcing all ports to be ON-HOOK when an alarm occurs	

Note: For S (customer's special bit), please refer to SFP brochure or contact your nearest Loop sales representative.

Product Specification for E&M Interface Card

Connector	Eight RJ45
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF
Encoding	A-law or μ -law, user selectable together for all
Impedance	Balanced 600 or 900 ohms
Longitudinal Conversion Loss	> 46dB
Longitudinal Balance	> 63dB
Gain Adjustment (Per-port setting)	-10 to +7 dB / 0.1dB step for transmit (D/A) gain -10 to +14 dB / 0.1dB step for receive (A/D) gain
I/O voice power range	A/D digital input level: -66 dBm (0.00039 Vrms) ~ + 3 dBm (1.09 Vrms) D/A analog output level: -66 dBm (0.00039 Vrms) ~ + 7 dBm (1.74 Vrms)
Signal/Distortion	> 25dB with 1004 Hz, 0dBm input
Frequency Response	+0.5 to -0.9 dB from 300 to 3400 Hz
Carrier connection	Side A (exchange side) and Side B (carrier side) setup by side switch
Idle Channel Noise	Max. -65 dBm0p
wire mode	2 wire and 4 wire (programmable)
Signaling	Type 1, Type 2, Type 3, Type 4, and Type 5, Transmit only (programmable)
Modems	Full compatibility with V.90 modems
All in-band signaling tones are carried transparently by the digitizing process.	
Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.	

Application Illustration



Standard E&M Interface Equipment Link or Tandem Connection



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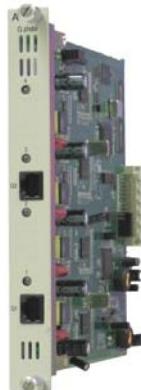
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G.SHDSL Interface Card for Loop-O9500R

Features

- Data rate of $n \times 64$ Kbps, $n=1$ to max n , where max $n= 1-31$
- Distances vary by line rate.
- Uses industry standard PAM line format.
- Software field upgradable
- One-LED indication per port
- Two Port G.SHDSL card supports 1+1 protection



2 channel G.SHDSL



4 channel G.SHDSL

Description

Loop Telecom's G.SHDSL plug-in card is designed for the Loop-O9500R. This card allows direct connection to wire pairs using 16PAM transmission technology. Versatility of this card comes from the choice of data rates, with the lower data rates applicable to longer reaches. The G.shdsl plug-in card can work with Loop-H 3300-3S, and is compatible with other G.SHDSL equipment.

The G.SHDSL plug-in card supports configuration and diagnostics using a local or remote terminal connected to the main unit. This allows in-service diagnostics and fault isolation.

Ordering Information

To specify options, choose from list below:

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of ordering code.

Model	Description	Note
Loop-O9500-R-2GH- G	2-channel G.SHDSL plug-in card (2 pair)	This card can also be used in the Loop-AM3440-A/B/C.
Loop-O9500-R-4GH- G	4-channel G.SHDSL plug-in card (1 pair)	This card can also be used in the Loop-AM3440-A /B/C.

Accessories

User's Manual

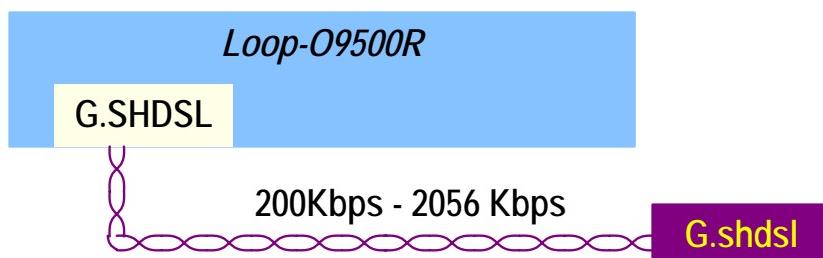
Loop-O9500-R-GH-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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Product Specifications for G.SHDSL Interface Card

G.shdsl Line Interface (2GH/4GH)

Number of ports	2 or 4
Line Rate for 4-channel G.shdsl	n x 64Kbps (n= 3 to 31)
Line Rate for 2-channel G.shdsl	n x 64Kbps (n= 3 to 15)
Line Code	16-TCPAM, full duplex with adaptive echo cancellation
Connector	RJ45
Electrical	Unconditioned 19-26 AWG twisted pair
Sealing current	Max. 20 MA source current
Clock Source	From System, Line
Diagnostic Test	G.SHDSL Loopback: To-LINE, To-bus BERT: QRSS

Application Illustration



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LS-Fiber Optical Interface for Loop-O9500R

Features

- 4/1 port per card, single slot to O9500R
- Supports data rates up to 12x64kb
- Provide multi-color LED indicator
- With ALS (Automatic Laser Shutdown)



Description

The LS-Fiber Optical plug-in card is designed for slots 11~16 of Loop-O9500R as embedded 1 or 4 C37.94 low speed optical interface. This plugged-in card can be used to aggregate 1 ~12 DS0 channels to single fiber optical interface to connect with other Loop-O9500R device or C37.94 Modem.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

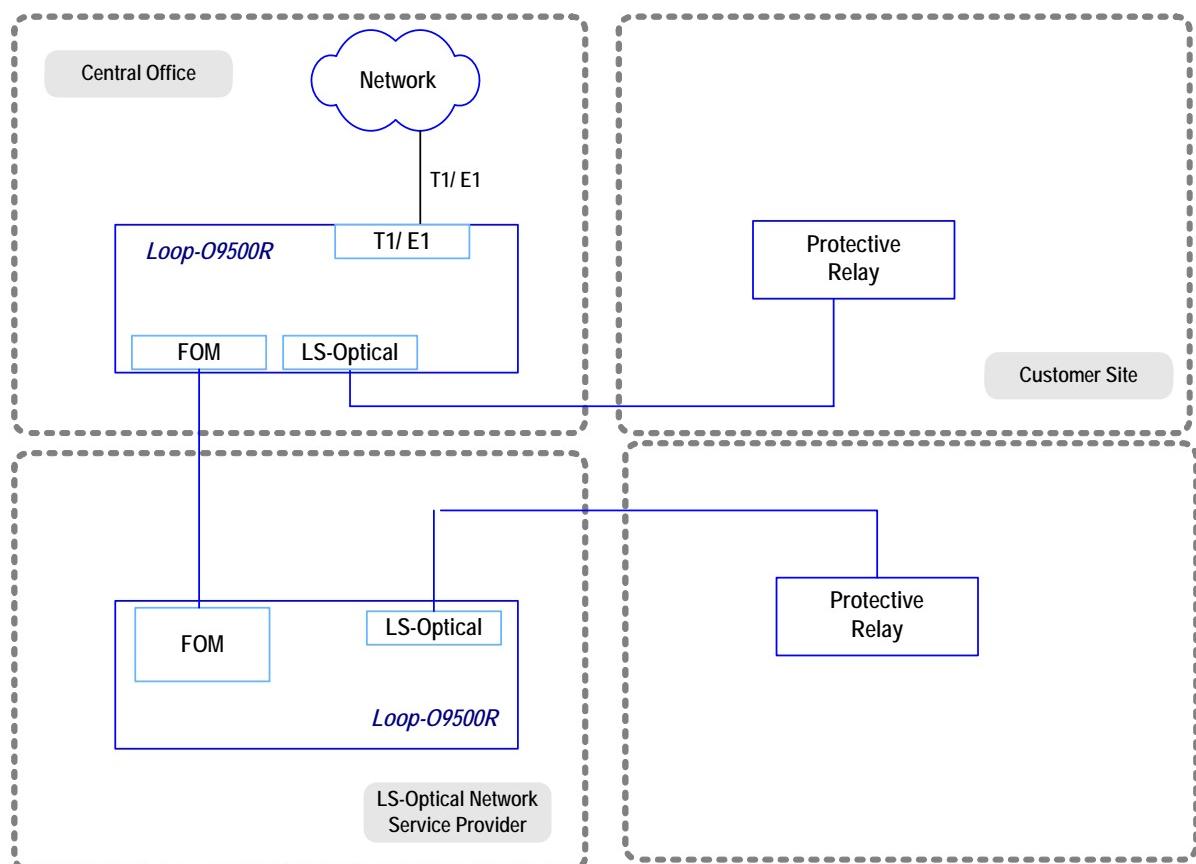
Model	Description	Note
Main Unit		
Loop-O9500-R-1C37-G	1- channel C37.94 plug-in card	These cards can also be used in the Loop-AM3440-A /B/C
Loop-O9500-R-4C37-G	4- channel C37.94 plug-in card	
Accessories		
User's Manual		
Loop-O9500-R-C37-UM	Optional hard-copy (paper) User's Manual. A CD version of the manual is already included as standard equipment.	

Product Specifications for LS-Fiber Optical Interface Card

C37.94 Interface (1/4C37)

Source	LED
Wavelength	820nm 2Km reach
Connector	ST
Optical Budget	50 Mircon core/9.6 db 62.5 Mircon core/ 15db

Application Illustration



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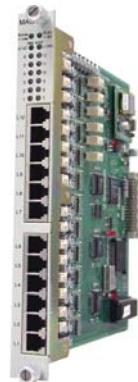
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Magneto Interface Card for Loop-O9500R

Features

- 12 telephone connections for Magneto
- Supports MRD (Manual Ring-down)
- Supports Magneto to FXS speak PLAR function
- Supports dual type L1/L2 and L1/GND magneto phone or MRD
- 16Vrms minimum detectable ring



Description

The twelve channel MAG plug-in card is designed of the low speed single slot of Loop-O9500R series. This module allows communications between magneto telephones. With the card set in PLAR mode communications can take place between a magneto telephone and a regular telephone. All signaling is carried transparently by the digitizing process.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model (RoHS compliant)	Description	Note
Loop-O9500-R-12MAG-1G- x-G	12-channel Magneto plug-in module w/ L1. GND	
Loop-O9500-R-12MAG-12- x-G	12-channel Magneto plug-in module w/ L1, L2	12MAG-1G2 includes all function of 12MAG cards.
Loop-O9500-R-12MAG-1G2- x-G	12-channel Magneto plug-in module w/ L1, L2, and L1. GND	
Loop-O9500-R-12MAG-A-1G- x-G	12-channel Magneto ring-one-time plug-in module w/ L1. GND	
Loop-O9500-R-12MAG-A-12- x-G	12-channel Magneto ring-one-time plug-in module w/ L1, L2	12MAG-A-1G2 includes all function of 12MAG-A cards.
Loop-O9500-R-12MAG-A-1G2- x-G	12-channel Magneto ring-one-time plug-in module w/ L1, L2, and L1. GND	

Accessories

User's Manual

Loop-O9500-R-12MAG-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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■ Where **x** is used to select version type:

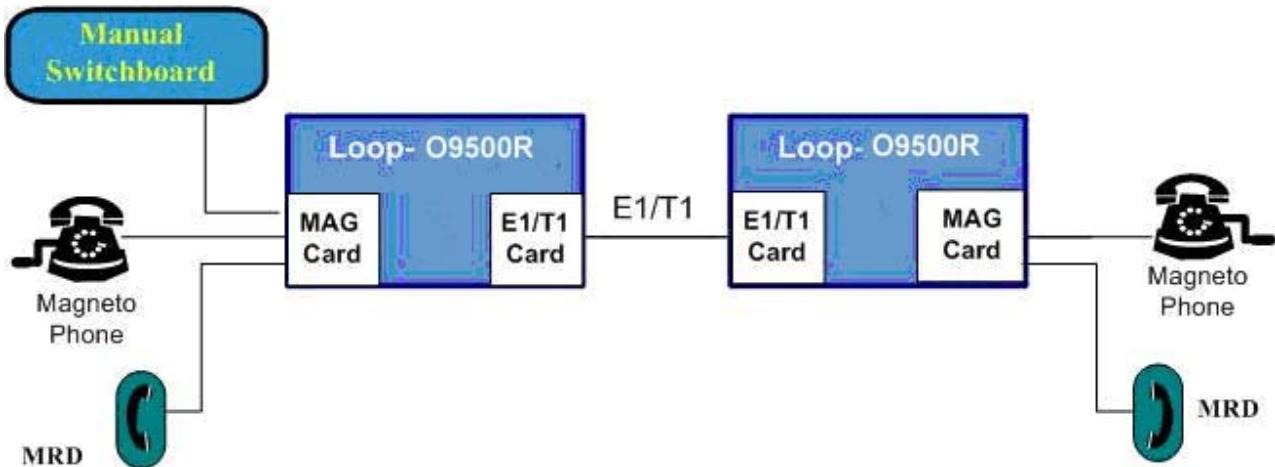
x=	Description	Note
16	16 Hz ring generator	20 Hz is the general setting for all MAG cards. For special settings (16,25,50), please specify your need by filling in the x option.
20	20 Hz ring generator	
25	25 Hz ring generator	
50	50 Hz ring generator	

Magneto Interface Card Product Specifications

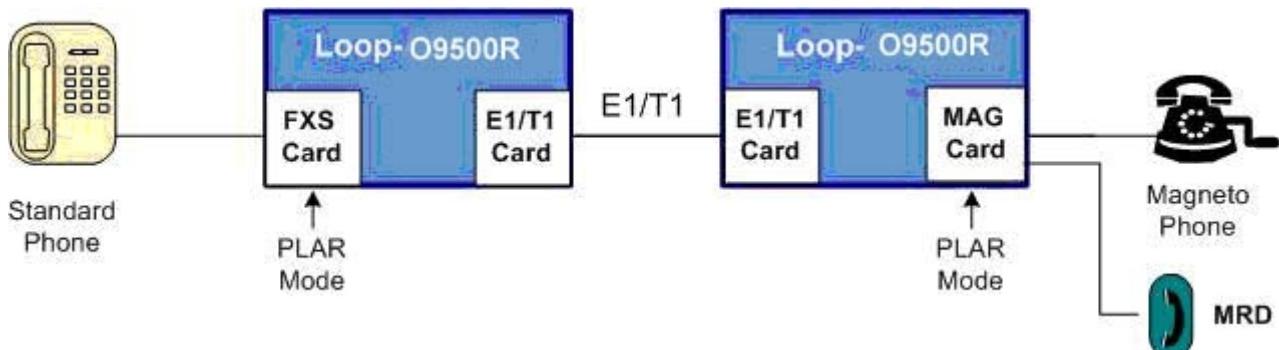
Magneto (old crank-handle hot-line telephones), MRD (Manual Ring Down) Voice Card

Connector	RJ11 x 12
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF
Encoding	A-law or μ -law, user selectable together for all
Impedance	Balanced 600 or 900 ohms (for magneto telephone impedance)
Longitudinal Conversion Loss	> 46dB
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712
Idle Channel Noise	Max. -65 dBm0p
<u>Signaling</u>	
Minimum Detectable Ringing Voltage	16 Vrms
Crank Detectable Across	L1 & L2 Mode (Tip and Ring), L1 & GND Mode(Tip and GND)
Crank Detected time	Valid crank: more than 250 ms
Ringing Generation	Invalid crank: less than 160 ms Voltage: 76 Vrms (sine wave) Frequency: 20Hz (with optional choices of 16, 25, 50 Hz) Two optional modules are available for your choice: 1. 12MAG Normal operation: Ring duration depends on cranking time PLAR ON operation: when FXS phone off-hooked, the ring duration of the far-end magneto phone could be 0.5, 1.0, 2.0 or 4.0 sec
Ring duration	2. 12MAG-A Normal operation: Crank the phone for one time, and the ring duration of the far-end phone could be 0.7, 1.5 or 2.0 sec PLAR ON operation: when FXS phone off-hooked, the ring duration of the far-end magneto phone could be 0.7, 1.5 or 3.0 sec L1 & L2 Mode (Tip and Ring), L1 & GND Mode(Tip and GND) Turn Magneto Phone crank (Ringing across Tip and Ring or Tip and Ground) Programable
Ringing Send Across	
Signaling	
Signaling Bit A,B,C,D	
• Signaling is carried transparently by the digitizing process.	
• Use Magneto card default setting for communications between magneto telephones	
• Use Magneto card PLAR mode setting for communications between a magneto telephone and a regular telephone	

Application Illustrations



Standard Magneto Phone to Magneto Phone



Note: The Magneto card in both figure 1-1 and 1-2 support two ring duration types: MAG or MAG-A. For detailed information, please refer to Specification.



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Router-B Interface Card for Loop-O9500R

Features

- Eight ports of 10/100BaseT interfaces
- Auto MDI/MDI-X crossover
- Routing Protocol: RIP-I, RIP-II, OSPF (Open Shortest Path First) and static route
- Remote Software Upgradeable
- Supporting Protocols: PPP, MLPPP, HDLC, Frame Relay, and Cisco compatible HDLC
- VLAN-ID mapping
- Up to 64 WAN ports with aggregate data rate of 8 Mbps
- Remote bridge support (padding/un-padding Ethernet FCS)
- Support of QoS (Quality of Service)



Description

The Router-B plug-in card is designed for the single slot of Loop-O9500R. When used within the Loop-O9500R, this card combines the function of a router and directs Ethernet traffic to/from multiple WAN channels. With this card, access from LAN to WAN is accomplished within one card, resulting in savings in cost and in space.

Ordering Information

To specify options, choose from the list below.

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of ordering code.

Model (RoHS compliant)	Description	Note
Loop-O9500-R-RTB-G	8-LAN port/64 WAN ports router/bridge plug-in card	This card can also be used in the Loop-AM3440-A /B/C.

Accessories

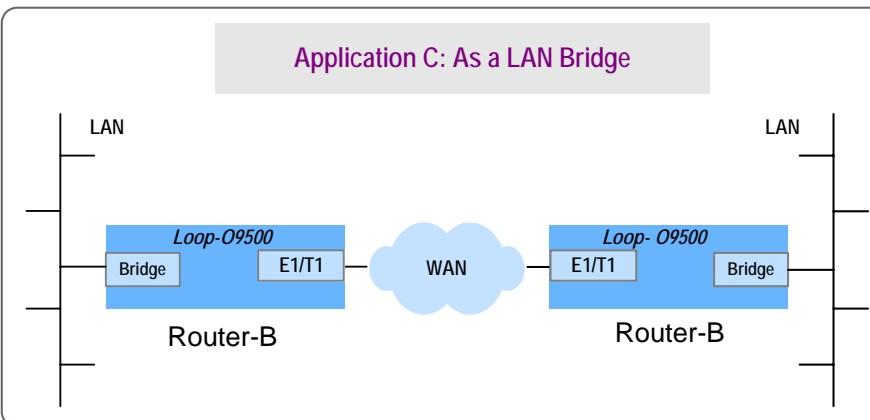
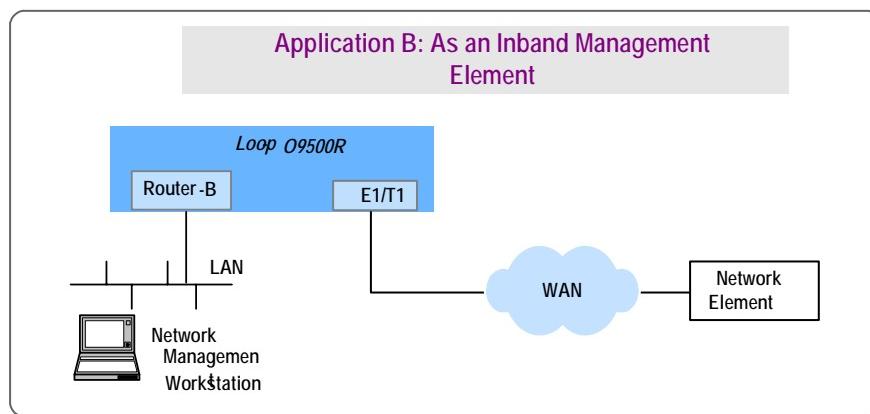
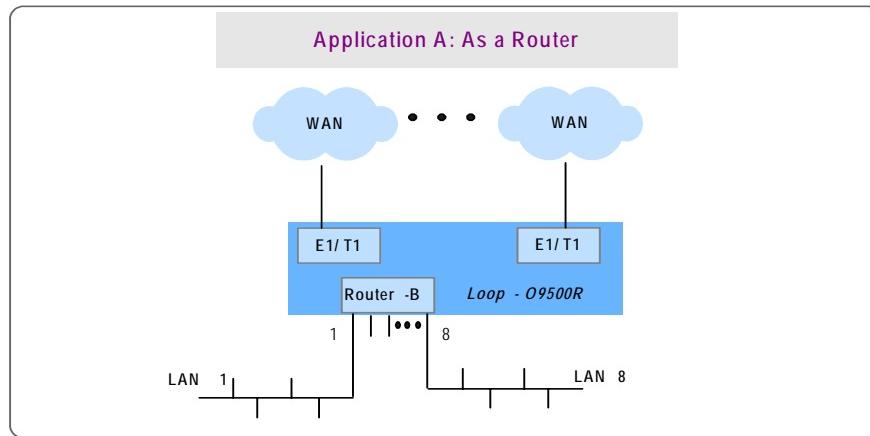
User's Manual

Loop-O9500-R-RTB-UM	User's Manual (paper copy). Note: A CD version of the manual is already included as standard package.
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Product Specifications for Router-B Interface Card

Number of ports	8 LAN ports, Max. 64 WAN ports. Each WAN port has data rate $n \times 64K$ bps, $1 \leq n \leq 32$ (≤ 8 Mbps for total of all 64 WAN ports)
Physical Interface	10/100 BaseT x 8
Connector	RJ45
Routing protocol	RIP-I, RIP-II, OSPF, Static
Supporting Protocols	PPP (IPCP/BCP), MLPPP, HDLC, Frame Relay, and Cisco compatible HDLC, NAT/NAPT, DHCP
Diagnostic	Ping, Trace route
QoS	Rate limit

Application Illustrations



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